Soundscape

DIGITAL AUDIO WORKSTATIONS

SS8IO-3
8 Channel Audio Interface

User's Manual

Revision 1.0

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TDIF

SS8IO-3 8 Channel Audio Interface

The Soundscape SS8IO-3 8 Channel Audio Interface provides eight high quality analogue input/output channels, combined with the TDIF (Tascam Digital Interface) multi-channel digital audio interface and 8 channel LED input level indication. The TDIF digital interface is now an 'industry standard' and was originally designed for the popular digital multi-track tape machine - the Tascam DA-88. This interface now appears on a variety of different digital mixing consoles, sound cards and converter units.

The SS8IO-3 can be used with the Soundscape **mixtreme** Soundscape SSHDR1-Plus Digital Audio Workstation (or with an SSHDR1 upgraded with the SSAC-1 Accelerator Card and Version 2.0 software) to convert the TDIF interface of the SSAC-1 into eight analogue inputs and outputs.

The unit can also be used to add additional analogue channels to some of the digital mixing consoles that have TDIF interfaces as standard. Examples of these include the popular Yamaha 02-R and 03-D consoles.

The components used in the SS8IO-3 for analogue input and output are of the highest quality, ensuring that in this very important area, the audio performance is excellent. The 20 bit analogue to digital (AD) and digital to analogue (DA) converters are from AKM and are well known as providing superior quality digital audio conversion. These and the input/output amplifiers are expensive components which meet the exacting requirements for professional audio recording/reproduction and provide a higher performance level than can be obtained with converters intended for multi-media applications (as used for low cost soundcards).

The SS8IO-3 also allows sample rate synchronisation using external Wordclock signals or these can be derived from the TDIF digital interface. Synchronisation with external Superclock signals at 256 x Wordclock rates is also provided. Superclock is the clocking rate for digital audio devices such as AD/DA converters or digital audio receivers/transmitters. It can provide a more secure synchronisation method than using Wordclock when several digital audio devices are connected together and are slaving via timecode to a device such as a video or audio tape machine, film projector or film editing table. In most circumstances Superclock will not be required.

Front Panel

From the front panel, you can select and view the current sample rate and select the clock source. All current settings are saved in an internal EEPROM (electrically erasable programmable read only memory) The LED input metering indicates green there is a signal at a level above -30dBFS and red when the level is above -3dB.

Rear Panel

The SS8IO-3 rear panel has 8 unbalanced analogue inputs and outputs, all with RCA/cinch connectors. A standard female 25-way sub-D connector for the TDIF port is also provided, with two RCA (cinch) connectors for generating or receiving external Wordclock or Superclock. An 8-way DIL switch is used to set options for the Wordclock or Superclock synchronisation.

The unit can be powered with the 9V 230V AC supply (or 115V AC nominal) supplied with the unit, at 50Hz or 60Hz.

Power consumption is 5W.

Technical Specifications

Sample Rates
44.1kHz (-27%) to 48kHz (+12%) with clocks resolved from TDIF or external Wordclock inputs.
Internal sample rate generator 44.1kHz or 48kHz (+/-30ppm)
16kHz to 48kHz (+12%) with Superclock input.

Digital Ports

TDIF (Tascam Digital Interface)
8 Channel bi-directional 24 bit digital interface with 25-way sub-D female connector.
Conforms to Tascam TDIF-1 specification.

Analogue Ports

8 x Analogue Outputs
Single-ended input amplifiers with RCA/cinch connectors.
Output level +3.5dBU.
AKM 20 bit DA Converters.

Maximum output level	-	+3dBU
Output S/N Ratio	-	-97dB unweighted
Output THD+N	-	less than –94dB (at 1kHz -20dBFS)
Output Crosstalk	-	-100dB (at 1kHz FS)
Frequency Response	-	30Hz to 20kHz (-0.2dB)
Passband Ripple	-	+/-0.005dB

8 x Analogue Inputs
Single-ended input amplifiers with RCA/cinch connectors.
Input Level +3.5dBU.
AKM 20 bit AD Converters

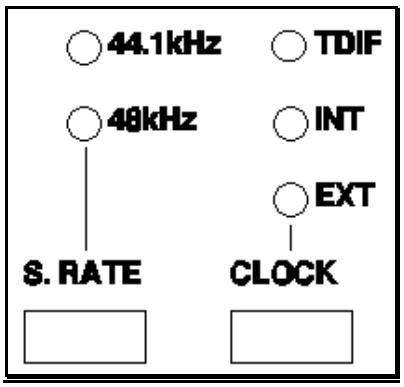
Maximum input level	-	+3dBU (for full scale)
Input S/N Ratio	-	-97.5dB A weighted
Input THD+N	-	better than 0.01% (at 1kHz -1dBFS)
Input Crosstalk	-	-100dB (at 1kHz FS)
Frequency Response	-	30Hz to 20kHz (-0.2dB)
Passband Ripple	-	+/-0.005dB
Input Impedance	-	30kohms

Metering
8 channel LED input level metering at -30dBFS and -3dBFS.

Clocks
2 x RCA(cinch) connectors for W/S Clock in/out.
Resolves clock from TDIF digital inputs or from external Wordclock or Superclock (256 x Wordclock).

Internal clock generator (44.1kHz/48kHz).
Generates external Wordclock or Superclock signals from any clock source.
Wordclock phase shift is selectable via rear panel Option DIL switches.

Main Operation



The front panel buttons and LED indicators are used to set up the sample rate and clocks. A description of the operation follows:-

S. RATE

The S. RATE (Sample Rate) button allows the internal wordclock of the SS8IO-3 to be set to 44kHz or 48kHz. When internal clock is not being used, the LEDs will indicate the actual sample rate that is being received. If there is an error or the sample rate does not fall within the tolerances which are normally expected, then the LEDs will flash. If pressing the S. RATE button has no effect on the sample rate, then check that the CLOCK (see below) is set to INT (internal).

CLOCK

The CLOCK button is used to select the source for the wordclock used. A wordclock can be derived from the TDIF input, or from the external (EXT) wordclock/superclock (W/S CLOCK) input on the rear of the unit, or the internal (INT) clock can be used. If there is no signal detected for the selected clock source, then the LED will flash to indicate an error.

Using the SS8IO-3 with the mixtreme PCI Card or SSHDR1-Plus

Generally when the SS8IO-3 is used with an SSHDR1-Plus system, the major requirement will be to turn the 8 digital in/out channels from the SSAC-1 TDIF port into analogue channels. Connect the SS8IO-3 TDIF port to the TDIF connector on the **mixtreme** PCI Card or SSHDR1-Plus unit. Normally the TDIF Clock setting should be used for the SS8IO-3, as the SSHDR1-Plus or **mixtreme** PCI Card would be set to Internal Clock and so would determine the sample rate.

Rear Panel Settings

OPTION 8-Way DIL Switch

The OPTION 8-way DIL switch on the rear panel of the SS8IO-3 allows setting of parameters relating to generating or receiving wordclock (sample rate) and superclock (256 x sample rate) signals for the W/S Clock in/out and for the TDIF port. These should only be changed from the factory default positions (shown below) when you have a specific case that requires a different form of clock synchronisation. This would be the case if you need to use superclock instead of wordclock.

Sync In sets the type of signal required at the W/S Clock input.

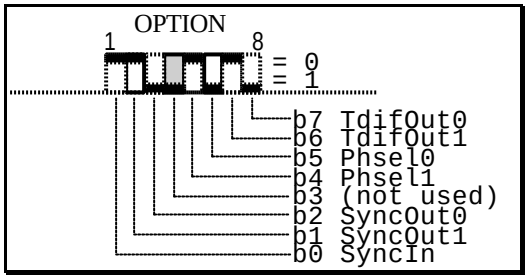
Sync Out sets the type of signal generated at the W/S Clock output.

n.c. is a spare switch with the current firmware revision.

Phase Select allows the phase relationship of the wordclock relative to left/right clock (part of the digital audio stream) to be selected. Some devices specify that there should be for example, a 90° phase shift between the timing of the wordclock logic signal and the left/right clock, so it can be important in ensuring that the audio data is transferred error free.

TDIF Out selects the type of wordclock that is generated for the TDIF interface port.

The settings are shown from left to right, so for example, Switch 2 (SyncOut1) is set to '0' (up) and Switch 3 (SyncOut0) is set to '1' (down), so reading both switches gives 01.



Note

Factory default settings are as shown in the diagram :-

Sync In	0 - wordclock
Sync Out	01 - wordclock
n.c.	1 -
Phase Select	01 - 90°
TDIF Out	01 - wordclock

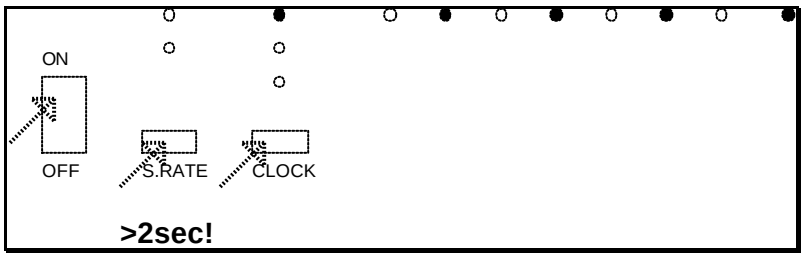
Sync In (Sw1)	0 - wordclock
	1 - superclock.
Sync Out (Sw2, Sw3)	00 - no signal
	01 - wordclock
	10 - phase shifted wordclock
	11 - superclock
n.c. (Sw4)	1 -
Phase Select (Sw5, Sw6)	00 - 0°
	01 - 90°
	10 - 180°
	11 - 270°
TDIF Out (Sw7, Sw8)	00 - no signal
	01 - wordclock
	10 - phase shifted wordclock

For the Option DIL switch setting displayed in test mode (see later), the bit positions are as follows :-
SW1-b7, SW2-b0, SW3-b6, SW4-b1, SW5-b5, SW6-b2, SW7-b4, SW8-b3

Test Mode

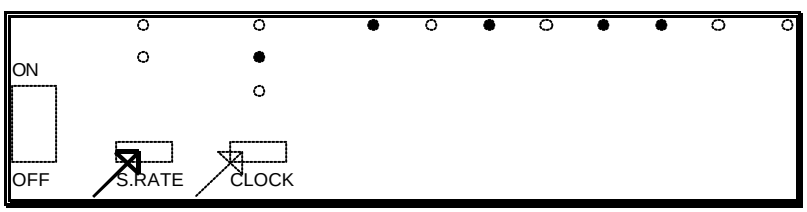
There is an internal diagnostic mode which tests the EEPROM, shows the Option DIL switch settings, shows the firmware revision and checks all LEDS. The test mode can be entered by pressing and holding the S.RATE and CLOCK buttons for at least 2 seconds during power up. Press any button to advance through 4 diagnostic steps.

Step 1: Release the S.RATE and CLOCK buttons when following LED's illuminate (hold down longer than 2 seconds): TDIF, ch#2(red),ch#4,ch#6,ch#8



The Unit is now in "non-volatile memory" test mode. If the test failed, the ch#8(red) LED will illuminate.

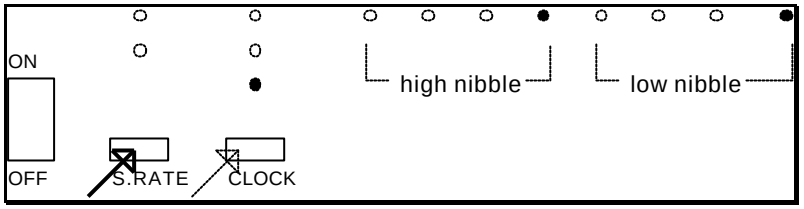
Press any button.
Step2: The Unit is now in "read-dip-switch" mode. The value of dip-switch is shown on LED's ch#1..8(red).



Factory default is indicated (rev1.1).

Press any button.

Step 3: The Unit is now in "firmware revision" mode. The value is shown on LED's ch#1..8(red).
Revision 1.0 : off/off/off/on/off/off/off/off
Revision 1.1: off/off/off/on/off/off/off/on



Press any button.

Step 4: The Unit is now in "led-test" mode.

Press any button:
Exit to normal operation !

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